

CA1
NT2
-1994
W 27

Working Paper 27/Document de travail 27

Government
Publications

EXPLORING BARRIERS TO SOUND ENVIRONMENTAL PRACTICES

By

J. Anthony Cassils

October 1994

Unedited Working Paper for Discussion

Quotation and duplication with
appropriate credit are encouraged

The views expressed herein are solely
those of the author

Document de travail non révisé, pour
discussion seulement

Les citations et reproductions avec
crédit sont encouragées

Les vues exprimées ici sont celles de
l'auteur seulement

For comments or copies please contact:

**National Round Table on the
Environment and the Economy (NRTEE)**

1 Nicholas Street, Suite 1500
Ottawa, Ontario, K1N 7B7
Ph: (613) 992-7189 Fax: (613) 992-7385

pour commentaires ou exemplaires contacter:

**Table ronde nationale sur
l'environnement et l'économie (TRNEE)**

1, rue Nicholas, bureau 1500
Ottawa, Ontario, K1N 7B7
Tél: (613) 992-7189 Fax: (613) 992-7385

3 1761 11709029 0



CA1
NT2
-1994
W27

Working Paper 27/Document de travail 27

Government
Publications

EXPLORING BARRIERS TO SOUND ENVIRONMENTAL PRACTICES

By

J. Anthony Cassils

October 1994

Unedited Working Paper for Discussion

Quotation and duplication with
appropriate credit are encouraged

The views expressed herein are solely
those of the author

Document de travail non révisé, pour
discussion seulement

Les citations et reproductions avec
crédit sont encouragées

Les vues exprimées ici sont celles de
l'auteur seulement

For comments or copies please contact:

**National Round Table on the
Environment and the Economy (NRTEE)**

1 Nicholas Street, Suite 1500
Ottawa, Ontario, K1N 7B7
Ph: (613) 992-7189 Fax: (613) 992-7385

pour commentaires ou exemplaires contacter:

**Table ronde nationale sur
l'environnement et l'économie (TRNEE)**

1, rue Nicholas, bureau 1500
Ottawa, Ontario, K1N 7B7
Tél: (613) 992-7189 Fax: (613) 992-7385



NATIONAL ROUND TABLE WORKING PAPER SERIES / SÉRIE DE DOCUMENTS DE TRAVAIL DE LA TRNEE

- 1 Prosperity and Sustainable Development for Canada: Advice to the Prime Minister
Développement durable et prospérité : Recommandations au Premier ministre
by/par Ronald L. Doering and David Runnalls
- 2 The Financial Services Industry and Sustainable Development: Managing Change, Information and Risk
by J. Anthony Cassils
- 3 Lender Liability for Contaminated Sites: Issues for Lenders and Investors
by Ernst & Young
- 4 Market Correction: Economic Incentives for Sustainable Development
by Mike Kelly
- 5 Environmental Regulations and the Canadian Pulp and Paper Industry: An Examination of the Porter Strategy
by Ronald L. Doering, François Bregha, Don Roberts, Steve Thompson and Dave Wilson
- 6 Environmentally Perverse Government Incentives
by Philippe Clément
- 7 Environmental Impact Assessment and Competitiveness
by Nancy Morgan, Martin Palleson and A.R. Thompson
- 8 Emerging Trends and Issues in Canada's Environmental Industry
by Anne Fouillard
- 10 Trade, Competitiveness and the Environment
Commerce, compétitivité et environnement
by/par David Runnalls and Murray Smith
- 11 Sustainability and Prosperity: The Role of Infrastructure
by Daryl Fields and Jack Ruitenbeek
- 12 Measuring Sustainable Development: Energy Production and Use in Canada
by Western Environmental Trends, Inc. (W.E.S.T.)
- 13 Exploring Incentives: An Introduction to Incentives and Economic Instruments for Sustainable Development
Revue des stimulants : Introduction aux stimulants et aux instruments économiques pour le développement durable
by/par J. Anthony Cassils
- 14 Canadian Round Tables on the Environment and the Economy: Their History, Form and Function
Les tables rondes Canadiennes sur l'environnement et l'économie : Leur historique, leur organisation et leur rôle
Mesas Redondas Celebradas en Canada sobre el Medio Ambiente y la Economía : Historia, Forma y Función
by/par/por Ronald L. Doering
- 15 Reporting on Sustainable Development in Support of National Decision-Makers
by François Bregha, John Moffet and Vic Nishi, Resource Futures International
- 16 Reporting on Sustainable Development: The Municipal and Household Level
by Dr. Trevor Hancock
- 17 Corporate Sustainable Development Reporting in Canada
by David Nitkin and David Powell, EthicScan Canada
- 18 Aperçu national sur la planification stratégique du développement durable dans les provinces et les territoires du Canada
par Philippe Clément
- 19 Canada's Agricultural and Trade Policies: Implications for Rural Renewal and Biodiversity
Politiques agricoles et commerciales du Canada : Répercussions sur le renouveau rural et la biodiversité
by/par Robert Sopuck
- 20 Linking Land Titles/Registry Systems in Canada to Land-Related Environmental Information
by J. Anthony Cassils
- 21 Renouvellement du cadre d'imputabilité du gouvernement dans le développement viable :
- Rôle possible d'un Commissaire ou Vérificateur à l'Environnement
A Renewed Framework for Government Accountability in the Area of Sustainable Development: Potential Role for a Canadian Parliamentary Auditor/Commissioner for the Environment
by/par François Bregha and Philippe Clément
- 22 Media, Fish and Sustainability: A Paper on Sustainable Development and the Canadian News Media
by Michael Keating
- 23 Harvesting Methods in Canada's Forests: A Discussion Paper
Méthodes de coupe du bois dans les forêts Canadiennes : Document de travail
by/par Steve Thompson
- 24 Municipal Reporting on Sustainable Development: A Status Review
by R. Douglas Burch
- 25 Sustainable Development as a Focus for Canadian Foreign Policy
by John Kirtan
- 26 Sustainable Development and Academic Institutions: Issues in Interdisciplinary Learning
- 27 Exploring Barriers to Sound Environmental Practices
by J. Anthony Cassils
- 28 Environmental Taxation, Revenues, and Effectiveness: The Need for Principled Guidance
by Robert J.P. Gale
- 29 Principles for the Sustainable Development of Pulp and Paper Products: A Report from the Pulp and Paper Round Table
Principes de production viable des produits de pâtes et papiers: Rapport de la Table ronde sur les pâtes et papiers
prepared by/publié sous la direction : Steve Thompson and Sarah Shadforth
- 30 After Rio: The Question of International Institutional Reform
Après Rio : Le problème de la réforme institutionnelle
by/par The Honourable Maurice Strong

**Exploring Barriers
To Sound Environmental Practices**

by

J. Anthony Cassils

October 30, 1994.



TABLE OF CONTENTS

	Page
Introduction	1
Part 1 - Definitions	2
Part 2 - Contrasting Perspectives - Barriers As Seen from Five Sectors	2
Agriculture	2
Energy	7
Fisheries	9
Forestry	14
Green Industries/The Greening of Industry	18
Part 3 - Observations	
From the Fringe to the Core	22
Linking New Knowledge, Beliefs, and Values	22
Implications of New Knowledge	23
The Economist May Have no Clothes	23
Ecology Influencing People on Many Levels	25
Understanding the Task	25
What is "Good Science"?	26
Visionaries and Incrementalists	27
Structural and Institutional Barriers	28
Denial of Problems by Some Leaders	30
Dogma and Self-Serving Propaganda	31
Part 4 - Conclusions	31
A Parting Note	33
Annex "A" A Sampling of Thinkers - On Barriers to Sound Environmental Practices	

INTRODUCTION

Adam said to Eve upon their expulsion from the Garden of Eden,
"This, my dear, is a time of transition." It always is.

In recent years, much has been written on economic instruments but very little on barriers to sound environmental practices. The idea of using economic instruments or financial incentives for environmental ends has been touted as a possible solution for decades, and the awareness of some barriers to sound environmental practices is not new. Since the 1960s, knowledge of the environment and of ecology has increased rapidly, providing evidence of the need for change supportive of environmentally-sound practices. This gives rise to the question: "Why has it taken so long to apply economic instruments or to remove fiscal barriers?"

The reason may be that the barriers in the tax system, for example, are just the tip of the iceberg, and that other barriers run deeper in the structure of organizations, human beliefs and value systems, and in basic assumptions about knowledge. This paper will focus on some of those underlying barriers.

To begin the exploration, **a number of people were interviewed in five sectors and asked to identify "barriers to sound environmental practices"**. The sectors explored were, **agriculture, fisheries, forestry, green industry and the greening of industry, and energy**. In each sector, where possible, a range of opinion was sought, for example, in the energy sector, the Canadian Petroleum Producers Association and the Canadian Wind Energy Association were asked for their perspectives, with one representing a dominant industry, and the other a fledgling, more environmentally-benign industry. Lists of barriers have been extracted from these interviews, and, as closely as possible, they reflect the words of the respondents. One list was compiled from a public report to government, and another, from a newspaper article. A **literature search** of some thinkers on the environment and the economy revisited some profound issues relating to values, and provided some insights that help to explain some of the apparent confusion of this era.

The paper has four parts and one annex: Part 1 defines "sound environmental practices" and "barriers" to their implementation; Part 2 sets out specific barriers in point form as raised by the people interviewed; Part 3, provides some analysis and observations; and, Part 4 draws some conclusions. Annex "A" gives a historical perspective and some insights on barriers from a sampling of thinkers on environmental issues. Part 2 contains the heart of the paper, and should make the greatest contribution to those people familiar with environmental issues. The other parts and the annex, put part two in context and, may be helpful for a broader public audience.

PART 1 - DEFINITIONS

Rapidly expanding knowledge regarding environment and ecology is defining "sound environmental practices". As knowledge of these subjects expands, the understanding of what constitutes a "sound environmental practice" will evolve. Therefore, a "sound environmental practice" is an action, determined by a reasoned judgement based on available evidence at any given time, towards an environmental objective considered to be in the public interest.

"Barriers" include anything that interferes with bringing human practices into alignment with a desired standard as defined by environmental science and ecology. Change of this magnitude may encounter many barriers. The time needed to consider the implications of new knowledge, is a barrier. Established institutions require reassessment to determine if their design and functions fit with the emerging world view. Some people begin to reconsider the value of their careers, lives, and businesses, and in so doing, trigger some emotional as well as intellectual barriers. Transformations of this scope make many people feel less certain. They can lose their sense of direction, and this can become manifest in terms of psychological and social stress. This can cause some people to resist change and to regard the barriers to sound environmental practices as barriers to be defended, until the accumulation of crises makes change unavoidable.

PART 2 - CONTRASTING PERSPECTIVES - BARRIERS AS SEEN FROM FIVE SECTORS

AGRICULTURE

A Perspective from Agriculture Canada

- Lack of agreement on the meaning of "sound environmental practice": Sound environmental practices will vary from region to region. Therefore, they have to be determined locally with local environmental expertise.
- **Different views of sustainability:** Some farmers in Saskatchewan may say that monoculture wheat production has been sustainable for fifty years and is still sustainable. Others may equate organic farming with sustainability, while some people claim that organic farming is not sustainable.
- **Insufficient scientific information** on which to base decisions: The Department asks two questions. What are farmers doing that is environmentally damaging? To what extent is the Department of Agriculture responsible for them doing it? The connection between the programs of Agriculture Canada and unsound environmental practices is very hard to demonstrate. The lack of information hampers policy analysis.

- **Externalities are not being measured**, nor are there immediate plans to start pricing rural amenities, such as, quality of landscapes, wildlife habitat, carbon fixing, and water purification.
- **Need to mesh scientific and economic information** in a way that makes a convincing case to farmers for moving to more sustainable practices. Now environmental performance is based on, for example, the amount of pesticide used by a farmer, but these indicators do not address the state of the land. Agriculture Canada is developing indicators for a range of biophysical concerns. This is a long-term process that should take five years.
- **Need more research and development:** On a per capita basis, Canada spends much less on research and development in agriculture than the United States does.
- Some barriers in agriculture are based on **tradition and culture**. It is one thing to have good information; it is quite another to generate the level of awareness and understanding that will encourage a farmer to change practices.
- **Conflicting environmental goals** can lead to unsustainable practices: for example, ethanol and methanol come from corn and grain. A major increase in the use of these fuels and the additional agricultural production this entails will cause environmental problems.
- **Policy makers need to adopt a longer time horizon:** Once sustainable practices have been determined, then a longer time horizon is necessary for their implementation. There could be some kind of incentive to encourage farmers to adopt these practices and to keep them in place for a number of years, on the path to environmentally-sustainable farming.
- The Department of Agriculture believes in **evolution not revolution**. They are undertaking a complete review of the safety net program, which should be completed by mid-1995. They are building their information base in support of more sound environmental practices. They would like to design subsidies so that they will be environmentally neutral. In this regard, they are **considering "whole farm" safety nets** to apply to a broad range of products to encourage the diversification of production.
- The conclusions of the **Report to Ministers of Agriculture, Federal-Provincial Agricultural Committee on Environmental Sustainability**, made in 1990 are still valid:

An **agro-ecosystems approach** to managing the sector is the **key** to conserving or enhancing the natural resources that agriculture uses or shares.

The same agro-ecosystems approach that leads to conservation or enhancement of the agricultural resource base, will also effectively address the off-farm environmental quality concerns which are so closely linked to management practices, inputs and technology used on the farm.

The adoption of effective resource management and environmentally sustainable practices is directly related to economic feasibility and viability of the practices.

Environmental sustainability is an important **key to long-term sustainability and competitiveness** in the agri-food sector.

The **assessment of the performance of the agri-food sector** and its contribution to national income **must take into account both the impact on soil, water and other natural resource capital, and the public cost of environmental damage** resulting from activities in the agri-food sector.

Producers, extension personnel and the general public must be the target for **education and awareness** activities that have been strengthened and refocused towards **environmentally sustainable agricultural systems**.

Current efforts to make the agri-food sector more environmentally sustainable are encouraging, but a **more consistently holistic approach must be pursued in all areas**, particularly education and research, to ensure significant long-term improvement.

A Perspective from Organic and Sustainable Agriculture in Canada ¹

- Barriers are internal and external. The internal barriers relate to **awareness, empowerment, competence, vision, and one's values**. External barriers include **access to resources, information, supports, land, and access to financial support**.
- Many farmers have an **instinct to overuse pesticides** following a tendency to want to control compulsively. Many farmers want to see, for example, straight rows of corn with no weeds in between, and will overuse pesticides even though the cost of the input may cause them to lose money on the crop. Beets can experience a 60% leaf loss without damaging the root, but most farmers would resort to pesticides before experiencing a 5% leaf loss. The spray gun becomes a symbol of control and power.
- **Subsidies trap farmers into growing certain crops and prevent them from diversifying**. These crops tend to be those that require fertilizers, irrigation and pesticides, and a whole suite of things that go along with these crops. They tend to be very high cost and this is why insurance programs are required. It is efficient to minimize input. If this is mentioned to Agriculture Canada, it is considered to be a blasphemy.
- **Agriculture Canada does not pay sufficient attention to organic farming**. Committees of Agriculture Canada regularly have representatives from the pesticides industry, but they do not have advocates for organic farming on these committees. There is security in group think and in the club that reinforces one another's views.
- Agriculture has been under threat in recent years and this makes it **difficult for the industry to entertain new ideas**.
- **Universities are not training people for the ecological approach to agriculture**. People who do cross-disciplinary work have difficulty obtaining nurturing.

¹ *This list of barriers has been developed from an interview and extensive articles provided by Stuart Hill of the faculty of Agricultural and Environmental Sciences at McGill University. His material contains twenty-five years of reflection regarding barriers to organic agriculture, and he probes into the psychological barriers to change taking the search to deeper and more subtle levels where many barriers lodge, but are seldom consciously acknowledged at the individual or the collective level. Understanding barriers requires this expansion of consciousness.*

- **"Narrow window" analysis** can be a barrier to sound environmental practices. For example, when a sector straddles both the federal and provincial jurisdictions, this can be used as a reason not to undertake holistic research.
- Stuart Hill proposes a **framework for decision-makers** that categorizes environmental measures under three categories: **efficiency, substitution, and redesign**. Efficiency measures are usually the easiest to implement, maintaining pest control with less pesticide for example. Substitution is more demanding and would include alternative natural inputs. Redesign involves the transformation of the industry towards permaculture and natural and ecological farming. The efficiency and substitution models are called "shallow sustainability", and, redesign, "deep sustainability".
- **Conflicting goals:** Some environmental policies, created to increase efficiency, can be a barrier to redesign. For example, some people will say that they do integrated pest management. Usually, this involves the use of pesticides, and may involve measures, such as, the timing of spraying, and using a different nozzle on the sprayer. This gives the appearance of making major progress, but can hinder the redesign of agriculture.
- **Social/cultural barriers:** In society, there is a general **lack of a profound awareness** of the destruction caused to the earth by current lifestyles. Most people still deny the seriousness of this deterioration. They **lack vision** and an **understanding of alternative ways** of doing things. This is particularly true at the political and economic levels, and within universities and other institutional structures, where conditions reflect widespread disempowerment, acceptance of muddling along, not rocking the boat, and avoiding failure or ridicule. The **undeveloped state of values** still focus generally on individuals, privileged groups, the immediate environment and the short-term.
- **Lack of research on agro-ecosystems:** What is needed is research on ways to design and maintain agro-ecosystems, and other managed ecosystems, so that they are resistant to problems. One of the most appropriate approaches to this is through **participatory action research** - research that sets out to bring about the change **collaboratively**, while documenting the process and outcomes, rather than studying the problems and solutions in isolation. Clearly, there is **little support for such research because it involves virtually no sale of products** and hence no industrial interest. It is becoming almost impossible in Canada, and in most of the industrial world, to receive significant research support from government without matching support from industry. This is a major barrier to the transition towards a post-industrial era.
- **Marketing barriers:** There are numerous infrastructural obstacles in the dominant **distribution systems** that are effectively blocking the marketing of organic products. Many **regulations** are also restraints, for example, those

ranking vegetables by their appearance and not according to the nutritional value or pesticide content. Also, **consumer understanding of organic products remains low.**

- Organic farmers face a number of obstacles when seeking **financing**. Often a lending institution will be unwilling to accept the financial statements of organic farmers, since they doubt that premium prices are available for organic produce, or refuse to lend to them because they do not farm with pesticides. Some government may deny loan programs to organic farmers. For example, in Quebec, a credit program is available for the purchase of new farm machinery. As organic farmers often prefer to acquire used equipment because new equipment is uneconomic in their operational strategy, they are denied access to this program, unless they are willing to acquire more than they need. Farmers in great financial difficulty have trouble obtaining financing if they would like to convert to organic farming.
- **Limited access to suitable equipment** (for tillage, manure and slurry management), supplies (e.g., biocontrol agents), and services (e.g., pest monitoring, conversion advice) is a barrier to more environmentally-sustainable farming.
- **Government programs provide insufficient support** to organic farmers.

ENERGY

Barriers Identified by a Representative from the Petroleum Industry

- **Enforcement strategies differ from province to province** and this is confusing for the industry.
- **Poor communications** both within companies in the industry and between companies and governments form a barrier to sound environmental practices. Both better communications and **education** are required, but, of the two, better communications is the higher priority.
- In the **current economic environment**, most people are focused on the bottom line, and there are **fewer people to do the environment-related work**. Care of the environment is written into most job descriptions, however, it is still important to have some people to do the overall coordination and to undertake the cheerleading.
- **Very few companies** in the petroleum industry are considering **diversifying into renewable energy** for the following reasons: in the 1980s, some of them diversified into the mining industry and the investment did not turn out very

well for most of them; and, many are following the principle of sticking to the business they know best.

- Some companies are looking into opportunities for **cogeneration** using flare gas, for example. They would be encouraged if they were credited for the power they generate for the grid against their future needs by the main utility.
- **Information on the environment is both abundant and uneven in quality.** This makes it difficult to know what is right.
- The Industry has bought into the voluntary approach to help Canada meet its **CO2 target**. However, governments and municipalities have been arguing that they do not have the funds to undertake the changes to meet CO2 targets. **Governments must do their part** and cannot expect those in industry to do this on their own.
- There is **little need to invest in renewable energy**. There is an oversupply of power in many provinces. Some utilities are paying to keep some facilities on idle. There is no need to invest more capital in energy projects at this time.

Barriers Identified by the Canadian Wind Energy Association

- One barrier is the **belief that Canada has an abundance of low cost energy** and is self-sufficient in oil well into the next century. In fact, growing demand outstrips new discoveries and imports are growing, especially in Atlantic and Eastern Canada. Also, the current price of oil does not reflect any associated environmental damage.
- Another obstacle is the **belief that natural gas, nuclear and hydro will solve future Canadian energy problems**. The social and environmental issues associated with coal and nuclear are unacceptable to the public. Natural gas as a partially recyclable feedstock for future generations is too valuable to be used for low grade heat and large scale electrical generation. The land use, political and environmental issues associated with more large scale hydro development in the wilderness is becoming very difficult.
- Doubts about the **dependability of wind energy** stemming from teething problems of more than a decade ago, still pose a barrier to the industry. Now, the reliability of wind energy systems has increased to in excess of 95% availability, and they are now competitive with any other form of new generation. Reasonable estimates are that at least 10% of Canadian energy requirements could be provided from wind energy.

- Another barrier is the **assumption that wind energy is valueless to utilities** because it is only available when the wind blows. In Canada, wind energy peaks in winter when the energy is most required.
- **Lack of funding:** In Canada, there has been a reluctance for utilities to become involved in activities considered small scale; independent or private, alternative, sustainable, innovative, environmentally-friendly or renewable. This is not the case in the United States or Europe. Industrial countries in Europe are planning to obtain as much as 10 % of their energy from wind by the year 2000.
- **Lack of Research and Development:** Since the mid-1980s when the National Research Council's Program on wind energy was cancelled, there has been little technical advancement of Canadian industrial capability and experience.
- **Lack of political clout:** Despite the many reasons favouring the use of wind energy, current market conditions, subsidies and monopolies favour the large utilities and conventional sources of energy. Incentives could be given to encourage the use of renewables, and markets could be created by setting renewable energy quotas, for example. In some cases it might be less expensive to invest in wind energy than to pour hundreds of millions of dollars into restoring old facilities, such as the damaged part of the Bruce nuclear plant. However, most large utilities reflect a bias for large projects and for the centralization of control and power generation.
- More people would turn to wind power if utilities allowed them to **link with the energy grid** and to benefit from a **banking policy**, whereby owners of wind generators would earn energy credits for surplus energy they provide in peak periods, and have the right to draw upon the credit as required.
- One major barrier results from **Canada being out of touch with recent developments** in wind energy. Canada is losing an opportunity to participate in an industry of the future. Also, it is failing to diversify its sources of energy supply. Diversification is a basic principle of sound investment and an intelligent precaution.

FISHERIES

Some Perspectives from Fisheries and Oceans Canada

- **Recent advances in fishing technology** have been an obstacle to sound environmental practices. A new vessel of forty-five feet may have the capacity to catch ten times as many fish as the vessel it replaces.

- There has been a **tendency of people to stay in the fishery** even though the capacity to harvest is increasing. This is placing excessive pressure on fish stocks.
- **People fishing for one species or for fish of a certain size, tend to dump those they do not want.** This can be an unintended effect of regulations which may limit the catch to fish of a certain size. Many fish so rejected could have become valuable had they been allowed to grow.
- The biggest barrier to sound environmental practices is the **need for people to make a living**, and the lack of options for people in some regions.
- Another barrier in the past was the **abundance of fish**. This gave rise to a wasteful ethic and wasteful technologies.
- There is a **need for better data** to provide an accepted basis for environmental regulation. This is of particular importance when the activities of one industry impinge on another, such as determining the effect of logging in British Columbia on the salmon fishery. Common data bases are needed to link together the bits and pieces held by various agencies.
- **More research and development is required:** A major, multidisciplinary cooperative marine ecological research program is necessary to provide a reliable basis for managing the recovery of cod and other groundfish stocks and their sustainable management in the future.
- There is a need for **better coastal zone management**, and this requires a good knowledge of the resources, a good understanding of environmental sensitivities, and cooperation and harmonization in the policies of many governmental agencies at all levels.
- **Institutional barriers** are a real difficulty, but there will be a quantum leap in the ability to deal with these barriers. Common data bases will help, as will the simplification and consolidation of some agencies.
- **Welfare and unemployment insurance** can be barriers for they can draw people into the fishery for short-term employment, and keep people in the fishery, indirectly making it more difficult to diversify the economy of Newfoundland, for example.
- **Unpredictable natural phenomena** can play havoc with the management of fish stocks. The waters around Newfoundland became much colder in 1990, and this contributed to a decline in the productivity of the stocks.

- **The difficulty in changing values and habits:** With education and communications, administrators have been trying to convince fishermen that they are co-managers of the resource. Part of the cultural tradition of some fishermen has been to help one another, but to deal begrudgingly with authority figures. In the past, the community store owners gained local prominence and influence often at the expense of fishermen. To some extent, government officials have become the authority figures, and the focus of some resentment, which hinders cooperation between governmental officials and fishermen.
- **Conflicting environmental values and objectives:** Harp and grey seals have increased rapidly in numbers during the past three decades. Since 1962, grey seal have increased at a steady rate of twelve and a half percent a year. Harp seals are even more numerous. In the Gulf of St. Lawrence and around Sable Island, it is estimated that grey seals are taking more cod than the fishery.
- On the **West Coast**, the major barriers are a **rapidly growing population**, spreading **urbanization**, and the need for more **sewage** facilities.

A Perspective from the Task Force on Incomes and Adjustment in the Atlantic Fishery (The Cashin Report) ²

- **New fishing equipment is expensive** and there is an incentive to use it as much as possible so the owner can **cover costs** in the short-term, even if this means the eventual depletion of the resource over the long-term.
- As many fishing enterprises operate on the **narrowest of margins**, there is a tendency to increase the volume of business.
- In much of Atlantic Canada, the fishery is the **employer of last resort**. Governments all too often have assumed that the fishery can absorb, just with the issue of licences, the unemployed from other industries as if fishing was a totally unskilled occupation for which no training is necessary.
- **Concentration of management on the resources rather than on people** and enterprises contributed to the collapse of the resource and the plight of the people. About 60% more people are claiming a place in the harvest than in the 1970s, despite limited entry. There is vastly more fishing power, in the offshore, midshore and inshore sectors. Fish plants have nearly doubled in number, plant workers have increased by about 50%. And yet, today, there are fewer groundfish than in the 1970s.

²Fisheries and Oceans Canada. *"Charting a New Course: Towards the Fishery of the Future"*. November 1993.

- **Very wrong miscalculations** about the abundance of the resource caused governments and communities to overestimate the harvest from the fishery. The understandable desire for increased local employment that led to the proliferation of the fish plants was fuelled by **boundless optimism** associated with the implementation of Canada's 200 mile limit.
- **Scientists did not listen carefully to fishermen.** Often, the inshore, fixed-gear fishermen have differed with scientists, saying that the resource was overestimated. They turned out to be right. Government scientists still have no systematic way of getting accurate information from fishermen, nor were they traditionally inclined to heed them, nor is there a true partnership with them. There is an obvious need for a much better relationship, and much more reliable data. Fixed-gear fishermen were pointing out the decline in certain cod stocks well before this was acknowledged scientifically, and before there was recognition that the models being used by scientists to predict the abundance were flawed.

Perspective from "The Globe and Mail" on the West Coast Fishery³

The drastic drop in West Coast salmon stocks has focused on the mismanagement of the resource and the causes, which are included here as barriers to sound environment practices:

- **Overconfidence and overfishing** have caught up with the West Coast salmon fishery, just as they did on the east coast.
- **Commercial fishing interests are able to influence decisions by the Pacific Salmon Commission** on how many fish can be caught and where. Estimates developed by the Commission are used by the Federal Department of Fisheries and Oceans in operating the fishery in Canada. There have been staggering discrepancies between estimates from the Commission and the DFO, both publicly funded organizations.
- **Besieged by competing interests** for a share of the catch, officials responsible for protecting the resource end up playing a high-risk game, not allowing enough margin for error when they permit fishing.
- **Overfishing and poaching are poorly policed** and rarely severely punished.

³Williamson, Robert; Miro Cernetig. *"Salmon Free-for-all Left Stocks in Peril"*. "The Globe and Mail", Saturday, October 8, 1994.

- A new **aboriginal commercial fishery** on the Fraser River, in which Indian inspectors do the patrolling, reportedly **has made a mockery of the enforcement of rules and catch limits.** Weekend and evening patrols have been beached because there is **no money to pay the inspectors** for overtime.
- The Department and the Commission have made **little investment in advanced technology** to improve the reliability of stock estimates and real-time monitoring of the fish harvest.
- Despite Canada's working with the United States to co-ordinate and control catching and conservation for the past 50 years, the two countries are still at each other's throats over hundreds of thousand Canadian salmon taken by Alaskan fishermen, and are still resorting to **fish-war free-for-alls** to spite each other - at the expense of the resource.

A Perspective from Aquaculture

Aquaculture in Canada is growing at 20% a year. The value of production has risen from practically nothing ten years ago to about \$300 million now. If aquaculture continues to grow at this rate, it will be one-third the size of the fishery by the year 2000.

- **Aquaculture has its own environmental difficulties.** The industry requires clean water if it is to be successful, and at the same time, they have to avoid toxic blooms near their fish. While the concentration of fish stocks causes pollution, it is in the interest of the operators to work closely with Governmental officials to avoid environmental contamination, since it threatens their livelihood.
- **Competing interests may oppose aquaculture.** Many suitable locations are remote from human settlements to avoid pollution, but the sites exclude other users such as traditional fishermen from some coastal areas, and recreational users like sports fishermen or boaters. The growing success of aquaculture is placing another form of competitive pressure on fishermen in terms of prices obtained for their produce.
- **Some environmentalists have reservations about certain aspects of aquaculture,** such as, concerns relating to: the use of therapeutic drugs; the bioengineering of species, which if they escaped might threaten the wild resource; and, the life cycle in the industry which requires the preparation of fish meal or the growing of crops to feed the stocks bringing in a whole other range of environmental considerations.

FORESTRY

A Perspective from Natural Resources Canada

- **Governmental organization** is a barrier to the integrated management of forests. Different agencies are responsible for forests, wildlife, fisheries, aboriginal people, community development, and the effect is to provide a conflict-based system, which makes it difficult to deal with broad issues such as sustainable development.
- Forestry has to deal with an **almost permanent hangover from the attitudes of the 1950s and 1960s**. Then, the focus was on using up natural resources rather than harvesting them. Companies were encouraged to build mills and were given access to forest resources. Now, an infrastructure exists based on the previous paradigm, and the level of investment, plus the total integration of the forest with the mill system, have nothing to do with the ecosystem.
- There is **chronic underfunding for science and research for forest management**. The Federal Government invests 4.2% of sales in R&D in fisheries, but only 0.13% of sales in forestry. Therefore, the industry is basically on auto-pilot from the perspective of environmental science. In Canada, the forest products industry is worth \$50 billion per year.
- There is a **lack of environmentally appropriate technology**. If Canadians do not know very much about their forests, then it is difficult to develop appropriate technology for harvesting them. For appropriate technology, Canadians have to go to a country like Sweden.
- A major obstacle to sound environmental practices is the **exclusion of workers and communities** dependent on the forest products industry **from participating in many of the major decisions affecting them**. Although there has been some change, forest management decisions are made largely in provincial capitals across the country among industry, governments and non-governmental organizations.
- Policy makers have placed **excessive focus on macro programs** for forestry, as opposed to providing micro-economic programs, which deal with what people need in the communities affected.
- The **timber focus in forestry management** is a barrier to sound environmental and business practices. If the primary concern is to grow trees in the face of ever diminishing flexibility because the focus is on timber production and not on ecosystems, the response is to push harder to produce faster on a limited land base. This is where it is necessary to move to agrarian type techniques, which are financially insupportable in Canada. If a forest takes 120 years to

grow, and money must be invested to plant and manage it, the financial return may be an uncompetitive 4% per year or less. A fundamental change in forest practices is needed to work with nature instead of against it.

- **Enforcement** is more than a barrier, it is **almost impossible** given the complexity of problems and the number of staff that would be required to go and check everything. When enforcement does become very strict, it causes **gridlock** and threatens the life of some companies in the forest products industry. The B.C. Forest Service is taking the "traffic cop" approach, handing out substantial fines if a culvert is built incorrectly, for example. Cutting plans for the industry used to be approved for three to five years, now it is down to one year. This makes business planning very difficult.
- Companies in the forest products industry tend to do most of their research on product development rather than on the forest management side. There is not **a lot on incentive for companies to do research on the forest management side**, for they find out that the more they learn, the less they can cut.
- As regards the **effect of the tax system on forestry** at all three levels of political jurisdiction in Canada, this subject has received insufficient attention in recent decades. However with regard to public lands, tax incentives under the federal Income Tax Act are likely to have an effect only on those individuals and corporations that have some equity in the future timber crops, and have to pay income taxes on the revenue earned in the extraction and processing of such crops. This would require some fundamental changes to the approach of the provinces to timber crop production.
- The historical **barriers to an equity position in future crops** have caused a partitioning of responsibilities for forest management. This has **contributed to inertia in the planning, finance, and implementation of forest management activities** on the part of the two senior levels of government and industry.⁴
- **Private woodlot owners often suffer from the free-rider approach.** They provide services such as the beauty of landscape, a refuge for wildlife, and biodiversity for which they are not compensated in the marketplace.
- The **model forest program** has been developed to address some of these barriers. It grew out of the work of the Forest Round Table set up by the **National Round Table on the Environment and the Economy**. To organize for ecosystem management, all the interests and expertise should come together in a partnership for the management of the resource. The model forests program has been very successful. The projects are located in every major eco-

⁴Boulter, David. *"Taxation and the Forestry Sector"*. Environment Canada - Canadian Forestry Services, Information Report E-X-33

region, and they blend good science, the needs of industry, ecologically-sound forestry management and local interests into very successful **partnerships**. These models cover **six million hectares** and provide living examples of sustainability.

Perspective on Barriers from a Company in the Forest Products Industry

- **Define sound environmental practices:** Sound environmental practices must be defined before they can be attained. The term can mean different things to different people. We believe that sound environmental practices should be consistent with the concept of sustainable development, and that continuous improvement over time is a reasonable objective.
- **Decision making not based on sound science:** Decisions are often based on emotions and politics instead of sound science. Despite a number of unknowns, decisions are made simply to "make a decision". Examples include:
 - pressure to eliminate chlorine from pulp making while the National Water Research Institute has been unable to establish a link between chlorine use at low levels and subtle effects on fish.
 - Targets set for limiting carbon emissions without agreement on the extent of the actual effects of the emissions, and without determining how we are going to achieve the targets, at what cost, and what other environmental factors will be negatively affected in achieving a single target.
 - Prescriptive limitations on forestry activities, such as: installing culverts "in-the-dry" to stop siltation in creek beds when the damming required to perform the task may cause more siltation than the culvert installation, or establishing areas for moose habitats without really knowing what the animal requires, while inexplicably not reviewing hunting regulations.
- **Magnitude of costs for diminishing environmental benefit:** All things can be attained if money were no object. Unfortunately, money is in short supply for both governments and industry. Our company is guided by the philosophy of sustainable development, which stresses the importance of balance between environmental and economic issues. We are committed to environmental leadership, but the survival of our company and the communities in which we operate, is of vital concern, as it is for all companies. Cost/benefit is a prudent way to look at environmental issues. For example, the cost/benefit of achieving the .8kg AOX limit proposed for 1999 may be favourable, but the immense cost of achieving the questionable benefit of zero-AOX may not be.

- **Government processes:** An inordinate amount of time is spent getting approvals and amendments. The quasi-judicial Environmental Assessment for Timber Management on Crown Lands in Ontario took over six years and many millions of dollars to complete. However, the decisions are under threat due to the government changing the nomenclature to "Forest Management" from "Timber" and pressure from the environmental community to bump up the new regulations.

Often, governments do not have a sense of urgency, and missed deadlines are too common. Delays are costly. Industry is often dictated to as to "what must be done" instead of indicating "what must be protected" and allowing the industry to work out the best, most cost-effective solution. Government personnel making the dictates often have little practical experience.

- **Lack of a single-window regulatory framework:** Overlapping jurisdictions and the growing myriad of multi-government environmental regulations, while having good intentions, are adding to inefficiency and resulting in solutions that may not be cost-effective.
- **Lack of good environmental research:** This relates to the magnitude of costs for diminishing environmental benefit. Good solutions take good research.

A Perspective from the National Woodlot Owners Association

- **Defects in the market:** There is a lack of internal competition in the Canadian market. Woodlot owners have insufficient opportunity to bid for timber licences. Also, the prices for forest products do not cover the full cost of the resource. The twenty-five year leases of public land are given to the largest corporations by the provinces with the explanation that only the large companies can provide the forest management required. These long-term leases are important to pulp companies when they do their banking, as they provide long-term security for a loan. The dominance of the market by the large pulp companies makes it difficult for those that create more value-added forest products to have access to the forests. Therefore, more open access and competition for raw materials are required.
- **The tax system works against sustainable forestry.** The depletion allowance and capital gains tax favour the clear cutting of forests. Someone who wants to produce sustainably is at a big disadvantage. Woodlot owners should be entitled to the same tax breaks for silviculture as are available to the family farm.

- **The level of knowledge and commitment to sustainable forestry among woodlot owners is uneven.** The capacity to carry out the responsibility of stewardship is weak in many cases requiring more education and training.
- **Uncertain financial support:** Woodlot owners have been reliant on the Federal government for financial support under the forest management programs through the Federal Provincial Forestry Resource Development Programs. These have become increasingly unreliable as sources of funding.
- **The need to make a paradigm shift from managing timber to managing ecosystems:** There is much confusion as to the meaning of sustainable forestry. People recognize the importance of managing ecosystems. Many will say that the knowledge of ecosystems is there, but it is not being managed in the context of the current economy. The bottom line is: What is the full cost of bringing a product to market?
- **Lack of consultation by regulators with land owners.** Partnerships are required to increase the co-operation and understanding of the need for integrated and sustainable forest management.

GREEN INDUSTRIES/THE GREENING OF INDUSTRY

Perspectives from Industry Canada

- **Complacency and the need for cultural change:** For every action that they take, people need to think of the impact on the environment, and to consider the options carefully. There is not a real commitment in the culture to do things in an environmentally-friendly manner. In the United States, schools are provided with training programs on ecosystems for children in kindergarten. It will take time to achieve the cultural change but this is a good starting point.
- **Financing:** Many of the environmental industries are small to medium sized. Many have products that are technologically advanced. Often, these operations do not meet the lending criteria of banks, and venture capitalists do not seem to understand the opportunities.
- **Contract work by some groups in the public sector** have been invading some of the markets of fledgling green companies and doing contract work for which they have been accused of not charging full costs. The impetus behind this movement has been the drive for some public agencies to become more self-supporting. In the private sector, the people who have been hurt the most by these developments are the **testing laboratories** and some of the **consulting companies**.

- **The need for more marketing and promotion:** The resistance to some very sound environmental measures are difficult to understand. For example, Energy Canada has been spearheading an excellent program to retrofit Federal buildings for much greater energy efficiency. It has taken a few years of hard work to bring most governmental departments onside. The financial case for adopting the program is strong. Subcontractors such as General Electric do the work and put up the financing, which is repaid within a few years from the energy savings. A perfect program may not be taken up until extensively and patiently marketed. Pilot projects have been a successful way of demonstrating the benefits of the program.

On the international side, many green industries do not know how to promote their products in the marketplace. Many of the markets are in developing countries, and very few of the Canadian green companies are marketing themselves well internationally.

- **Changing industry at the core:** Green industries provide products and services that will help all industry improve environmental performance. The greening of all industry is the overriding task. The ARET program (Accelerated Reduction and Elimination of Toxics Program) is a powerful incentive for change. They have developed three lists, and on the "A" list are 100 substances that are perceived to have a toxic impact. There is to be a voluntary 90% reduction of these toxic substances by the year 2000. Companies have been given the objectives, and, will determine themselves, the best way to attain them.
- **New management practices are required:** Industry is moving from an end-of-pipe focus and is placing more emphasis on anticipation and prevention. This requires a complete change of attitude on the part of management, and involves placing the environment as a key consideration in decision making, similar to the focus on quality.
- **Need to set clear long-term objectives and work with industry to achieve them:** Many businesses are under intense competitive pressure, and do not have the **cash flow** to make sudden and substantial investments to address environmental issues. Such changes have to be made over the longer-term, and governments and companies need to work patiently and collaboratively to attain environmental ends.
- **The need for a common understanding of sound environmental practices:** The work of the International Standards Organization on "The Guide to Environmental Management Principles, Systems and Supporting Techniques (ISO 14000) has been progressing very quickly in Canada with considerable support from the private sector.

- **Conflicting goals:** For example, in the case of a town served by a single industry, for example, a pulp and paper company, the company may have a very marginal operation, with insufficient cash flow to meet all the environmental demands placed upon it. The imposition of higher environmental standards on the company may force it to leave the country and to take advantage of many inducements for it to relocate in the southern United States, for example. The choice for government is to impose the environmental standards and hasten their departure, or to bring the standards into alignment with those of competing sites in other countries.
- **The imposition by government of ill-considered standards on industry:** On occasion, standards are imposed that are poorly thought through. This does limit innovation. It is better to give broad overall objectives, and to allow the private sector to decide the best ways to attain them.
- **No clear setting of environmental priorities:** Often, environmental issues emerge in a random way that makes it difficult for business to respond to them. This is not helped by the single-issue approach of some parts of the environmental movement. For examples, Greenpeace is trying to discourage the use of polyvinyl flooring. However, the alternatives may be just as environmentally damaging, but, by the time this information has surfaced, Greenpeace may have moved on to another issue. This could lead to a situation where policy makers are focusing on minor environmental issues, while major ones are being overlooked.
- **Impractical or unrealistic demands by environmental groups** can be a barrier to sound environmental practices. These can create resentment and resistance in industry. When a company has large capital investments, business schedules, and extensive involvement in the community, it takes time to introduce major change. Single-issue environmental campaigns may result in a poor selection of priorities, based on emotion and not on careful assessment.
- **Education and training for small and medium-sized businesses:** Many small companies, such as a dry cleaning operation, are run by people who do not realize that they may be causing environmental damage. Taxes will not increase their understanding. Education and training are required.
- **Understanding the investment cycles of businesses:** If environmental practices are proposed at times when companies make their investment decisions, then their processes can be adjusted to meet environmental standards more easily than after a new manufacturing system has been installed.

- **Governments need to take a longer-term view of their own environmental objectives to mesh these with the investment cycle of business.** The National Air Emissions Framework provides an excellent opportunity to begin this process of integration.
- **Governments have their own cycles and reviews.** It is difficult to come midway through and suggest changes for environmental reasons. It is important to catch them at the right time.
- **Persistent financial pressures** in both government and business **hinder the long-term thinking** necessary for the implementation of sound environmental practices.
- The **Canadian public feels that it is too heavily taxed now**, so the imposition of additional taxes for environmental purposes would not be well received. A **whole review of the tax system** is required to determine what could be done to encourage investment in areas such as closed-loop technology. As the Department of Finance is burdened with a heavy work load, a comprehensive review could be done by a tax foundation and various tax experts. The review would have to be very pragmatic, and assess the implications of various proposals on each sector of the economy.
- **Need to use more imagination in developing fiscal measures** that would not only limit the raid on the Treasury, but also solve some persistent environmental problems. For example, it could be done as a pilot. The tax code could be changed to create a window of opportunity to invest in a troublesome sector, like the pulp and paper industry, or alternatively, it could be done on a geographic basis by identifying those one-industry-towns where the industry is vulnerable, and create special incentives for investment in those sorts of facilities, so the effects of the tax expenditures would be limited.
- **The international dimension:** It is difficult for Canada to act independently on some environmental practices. While we may solve all our environmental problems, we may not have any industry left. Some people underestimate the real potential of industry to move.

A Perspective from an Environmental Industry Association

- **Environmental industries in Canada are fragile** because governments have not been raising environmental standards as anticipated, and so, demand for the products of their industry is not increasing as fast as expected. Without strong domestic demand, Canada is in danger of falling behind the leaders.
- **More emphasis needs to be placed on green procurement policies.** Governments have the potential to make a significant contribution here.

PART 3 - OBSERVATIONS

The challenge for policy makers is to bring clarity from confusion, and to manage the transition as quickly and as painlessly as possible.

Getting from the Fringe to the Core

There is considerable awareness and some progress towards more sound environmental practices, but some of those interviewed gave the impression that, while some change is occurring at the fringes, the overall and essential transformation of human practices remains elusive.

Linking New Knowledge, Beliefs and Values

During some interviews, it did not take long before comments turned to the subject of "values", which connect with beliefs. This nebulous area can be the source of many barriers to sound environmental practices, but because of their subtle origins, they can often be difficult to identify and to express. It is worth exploring some of these potential causes of barriers, for it may contribute to shared understanding, and hopefully, to solutions.

Andre Malraux, a French writer said that profound change is by definition subterranean, you never know where it will surface. Since human values are profound, **subtle shifts can emerge as a major transformation for society**. The shifts are rooted in both the emotions and the intellect.

New knowledge gives rise to beliefs, which are the source of values. Some people will respond more quickly to new information than others, and will change their beliefs. The leap from new knowledge to belief, involves, in part, an act of faith. With the accelerating increase of knowledge in recent decades, and since each person responds differently to new information, there has been a unprecedented fragmentation of shared social beliefs and values, resulting in considerable confusion.

During this century, new knowledge has contributed to the erosion of belief in the absolutes of Newtonian physics, science, and the religious promise of redemption and life after death. Still, these developments are shaking people to their depths. Over half a century ago, John MacMurray, the British philosopher, wrote : "Thought has begun to doubt its own monopoly of reason. As soon as that doubt enters, the very basis of our civilization begins to shake, and there arises, first dimly in the depths of us, but soon penetrating more and more clearly into consciousness, the cry for a new heaven and a new earth. The doubt and the question mark the opening of a new phase in human development."⁵

⁵MacMurray, John. *"Reason and Emotion"*. London: Faber and Faber, first published 1935, reissued in 1972, at p. 17.

Need to Understand the Implications of New Knowledge

Rapid changes in the assumptions underlying major bodies of knowledge can form barriers to sound environmental practices by creating uncertainty, which is not conducive to concerted action. The theory of relativity and more recently, the chaos theory, removed from science its pretence of control and its ability to predict. Some of the intellectual underpinnings born in the seventeenth century, were flawed. The **disillusionment** has carried over to the subject of economics, which grew from the same intellectual assumptions as science, but has not enjoyed nearly as much success. When science once promised a route to absolute truth, many economists were interested in proving that economics was a science. This interest ebbed against arguments that economics did not measure up to being a science, and, more quickly, when it became evident that there were no notions of science clear enough to make meaningful assessments of economics as a science.

The Economist May Have No Clothes or a Smaller Wardrobe than Anticipated

Economics, if not a science, is often considered to be a respectable empirical theory of human behaviour and its aggregate consequences. However, even this description cannot give rise to complacency, for the theory is bedeviled by its **predictive weakness**. The issue is elaborated in the following comments of Alexander Rosenberg:⁶

"The ability to predict or control may be neither necessary nor sufficient criteria for respectable scientific theories. But the fact is that microeconomic theory has made no advances in the management of economic processes since its current formalism was first elaborated in the nineteenth century. And this surely undermines a complacent conviction that the credentials of economics as a science are entirely in order. For a long time after 1945, it might have confidently been said that Keynesian macroeconomics was a theory moving in the right direction: although a macro theory, it would ultimately provide the sort of explanatory and predictive satisfaction characteristic of science. But the simultaneous inflation and unemployment levels of the past decade and the economy's imperviousness to fiscal policy have eroded the layman's and the economist's confidence in the theory. Moreover, the profession's reaction to the failures of Keynesian theory is even more disquieting to those who view economic theory as unimpeachably a scientific enterprise. For a large part of the response to its failures has been a return to the microeconomic theories which it was sometimes claimed to supersede... This cycle brings economic

⁶Rosenberg, Alexander. "If Economics Isn't Science, What is it?". Included in: *"The Philosophy of Economics, An Anthology"* second edition, edited by Daniel M. Hausman. New York: Cambridge University Press, 1994. Chapter 21.

theory right back to where it was before 1937, and should seriously undermine the confidence of anyone's belief that economics is an empirical science, with aims and standards roughly identical to other empirical sciences."

Economists have attained no independently substantiated insight into their domain to rival the biologists' understanding of macroevolution and its underlying mechanisms of adaptation and heredity. Also, while economics examines human behaviour, it cannot then infer from its observations, the beliefs and desires underlying that behaviour.

The shortcoming of economics makes clear that it cannot be expected to be a reliable guide to the behaviour of economic agents and to the performance of economies as a whole, for which the formulation of public policy looks to economics. In the words of Rosenberg⁷: "We should neither attach much confidence to predictions made on its basis, nor condemn it severely when those predictions fail. For it can no more be relied on or faulted than Euclidian geometry should be in the context of astrophysics."

The limits of economics have been made evident by the deterioration of the environment identified by real science. Values, not captured by economic theory, have produced an outcry reflecting the affront caused by environmental degradation to some human desires and beliefs. One of the founders of the Austrian School of Economics, **Ludvig von Mises**, stated that:

"Economic calculation cannot comprehend things which are not bought and sold against money... What touches the human heart only and does not induce other people to make sacrifices for its attainment remains outside the pale of economics."⁸

Given the erosion of faith in economic theory, what is the explanation for the continuation of its influence? The scope of the profession has attracted many intelligent people, and their insights transcend the limits of their discipline. Also, they are able to defend their positions well, although, as with a man of the cloth who has lost his faith, some of their affirmations ring hollow. Another reason is that economics addresses a very fundamental question: If society wants to achieve a goal, what is the most economically cost-efficient way of attaining that goal? However, since, by definition, economics is unable to encompass into its calculations, environmental damages or things valued by the human heart only, it treads on very fragile ground.

⁷*Ibid*, footnote 6.

⁸von Mises, Ludvig. "Human Action, A Treatise on Economics". Third revised edition. Yale University Press, 1963. At p. 214-15.

The evident shortcoming of economics is leaving a **vacuum at the foundation of public policy**. Traditionally, policy makers have looked to economics as a guide when faced with difficult choices. The growing knowledge of the environment and ecology may fill the gap with a far more solid base grounded in good science. Meanwhile, influenced by ecological considerations, ethics have begun to shape public policy by means of the "polluter pays principle" and the "precautionary principle".

Ecological and Environmental Information Is Influencing People on Many Different Levels

The concept of only taking from the environment what it can give on a sustainable basis, is very compelling and rational, for reason is the capacity of people to behave in terms of their knowledge of the world outside themselves. It is grounded in a rapidly growing body of knowledge based on good science. This has encouraged the reassessment not only of economic activities, but, also, of human organizations, infrastructure, political practices, and spiritual matters.

A new "bottom line" may be emerging based on the linkages between the health of each person and environmental health, with the health of the living cell possibly providing the fundamental measure. This may complement the more traditional concept of return on financial capital by grounding it in the real and living world.

On a more subtle level, some people have found in ecology, a concept that reconnects them with the earth and the ecosphere. This can be a **spiritual experience** or awakening for many, and a threat to the environment in any part of the earth can be interpreted by some people as a threat to each individual and to their loved ones. At the emotional level, this connection with all living things can relieve some of the isolation inherent in parts of the Western tradition, resulting from an individualism rooted in Cartesian thinking and in the Protestant belief that each person is personally accountable before God for his or her actions.

One of the great strengths of linking human activity with ecosystems, is that it brings together on one foundation, human material, emotional and spiritual needs. On the other hand, ecology influences people at so many different levels, it can make it difficult for people to understand one another's motives and to develop a consensus for action.

Understanding the Task - Integrating Partial Economics into Whole Ecology

During the past decade, there has been considerable effort to cost environmental damage, and to put ecology into the economics box, however flawed. This is an attempt to put the whole into the partial, good science into inadequate theories, and to translate ecology into a language that business understands.

However, it is important to proceed with the **major task** of absorbing the economic model into the ecological perspective as quickly as possible to bring human activities more in touch with the reality of the environment that sustains them, for this is the basis of health. This adjustment may provide a **clearer sense of direction** for society, and, reduce some of the anxiety caused by current uncertainty.

What is "Good Science"?

This exploration of some of the roots of current assumptions and beliefs is a prelude to considering an observation made by a number of people interviewed, that the decision to remove barriers and apply economic instruments should be based on "good science".

The term "good science" **can mean many things**. It may reflect the outdated belief that science can provide absolute truth, or, on a personal level, the need for reassurance and certainty in a very ambiguous world. The term "good science" begs the question: Does the user of the term mean **positivistic or holistic science**?

Positivistic science promises certainty, such as evidence that CFCs will be effective and financially-inexpensive refrigerants. It took decades to realize the true cost of CFCs with the erosion of the ozone layer. The narrow focus of some positivistic science has undermined its credibility. However, positivistic science has identified the thinning of the ozone layer, so its usefulness may vary depending upon whether it is being applied as the "science of exploitation" or the "science of understanding".

The science of exploitation centres about the development of a marketable product, with the potential rewards flowing to the scientists involved and to the sponsoring organizations. The science of understanding is more concerned with comprehending processes, for example, the effects of human activities on the environment. As the science of exploitation fits profitably with the market economy, it is more likely to be well funded than the science of understanding. This is producing an imbalance where the increase of the scope and power of human activities is outstripping the ability to comprehend the consequences of those actions.

Holistic science addresses the complexity of interactions and the interdependence of living things with each other and with the resources of the earth. This complexity makes it difficult to understand the implications of human activities on the environment, so the need of people for more certainty and predictability is still not met. However, it may relieve this frustration to know that more holistic scientific research is being conducted to determine with greater precision the effects of human action on the environment and ecosystems, so that the complexity will be more easily understood in the future.

Good science may require **more scientists to be closer to renewable resources**. In the case of the Atlantic ground fishery, the Cashin Report⁹ mentions that before the fishery collapsed: "Fishermen, especially those based inshore with fixed gear, had been saying for some time that there was a resource crisis, whose dimensions are now beyond even their most dire predictions." Perhaps the problems could have been avoided, in part, if scientists had been reporting to, and, conferring more with the fishermen.

The best scientific information will have little effect in the absence of **political will**. Often, political leaders avoid problems until they become crises. Also, the demand for "good science" can be used cynically by those benefitting from a delay in the implementation of some sound environmental practices.

Visionaries and Incrementalists

Although all those interviewed agreed that some change was needed in the way people interact with the environment, the pace of change appears to be a source of disagreement. For the sake of this discussion, those interviewed could be categorized as "**visionaries**" or "**incrementalists**".

Visionaries recognize, more quickly than incrementalists, the magnitude and the urgency of change required to align human activities with the carrying capacity of the environment. Visionaries would like to change the social, economic and political structures as quickly as possible to conform to this world view. If visionaries are in the crow's-nest of the ship, incrementalists are in the engine room. Incrementalists run the ship, look after the needs of the crew, oil the drive shafts, check fuel levels, and so, are subject to many demands. Those in the crow's-nest see farther than the rest of the crew, and if the ship works well, they are listened to, even though the course may not be changed immediately. Visionaries conceive of overall transitions, incrementalists prefer small steps.

Many environmentalists, scientists, and academics, fall into the category of visionaries. The private sector has some fine visionaries, but usually, the visions have narrower aims related to specific business responsibilities. **Most business managers favour incremental change**. It fits with the concept of continual improvement. It involves less risk for the organization. It permits the small scale testing of ideas, which, if successful, can build momentum and morale for additional change. Often, practical business experience indicates that it is better to take small steps and to reassess frequently.

⁹ Department of Fisheries and Oceans. "Charting a New Course: Towards the Fishery of the Future". Report of the Task Force on Incomes and Adjustment in the Atlantic Fishery. November, 1993.

Incrementalists may not see the destination as clearly as visionaries. However, their experience has taught them to distrust long-range predictions. Incrementalists may equate some claims of environmentalists about dire environmental prospects with **futurology**, which is not held in high repute in the business community. There are many reasons for doubt. In 1967, Herman Kahn and Tony Weiner published "The Year 2000", which brought Mr. Kahn a high profile and considerable consulting. The book became a source of much embarrassment, for they predicted that by the mid 1970s, fast breeder reactors for nuclear power plants would provide limitless electricity and desalinization plants would supply inexpensive water worldwide. They overlooked the oil crisis, overcrowded cities, the growth of slums and poverty, the expansion of south-east Asian countries, the collapse of the Soviet Empire, the increase in inflation, and growing environmental damage.

Some claims of environmentalists set off a reflex of scepticism among incrementalists. This can be heightened when some environmental groups engage in single issue campaigns, thinking that they are the picadors of the industrial bulls. From the perspective of some industries, the single issue campaigns often act contrary to more holistic understanding, and can skew attention from major to minor priorities. However, in some cases, it may be necessary to have single issue campaigns to raise broad public awareness. Also, some companies are abusive of the environment and need to be budged by something stronger than gentle words.

Incrementalists need to understand that **most environmentalists are not futurologists**. **Many environmentalists pay close attention to detail**, and, listen carefully to what science is saying about the present state of the environment. Although science may not be able to provide objective truth, it represents a disciplined approach to observing phenomena, which may be indicators of change. A business manager has to pay close attention to details as well.

A need for careful monitoring and attention to detail is a value common to "good science", incrementalists, visionaries, and to scientists, people in business and environmentalists.

Structural and Institutional Barriers

Structures and institutions shape the values of people, as much as, or more, than the values of people shape structures. In history, there have been times when clusters of new thoughts shatter institutions built on the old paradigms. This occurred in the Renaissance, in the seventeenth century with the emergence of the "age of reason", in the eighteenth century with the advent of the industrial revolution, and, in the present time, which is adjusting to the impact of the science of ecology.

Now, many **structures of the past**, whether they be intellectual, like economic theory, or organizational, for example, the corporation, **still dominate** most human activities. Much of the current direction of human action is at odds with the new

information on ecology. This situation can cause great stress and even bewilderment. This is the predicament of many thinking people.

Some people are faced with a difficult choice. They can stay within the organizations and structures of the old paradigm, where they will be given a position, and rewarded for compliance. Or they can live according to the new knowledge, before new structures have been established, but this entails considerable risk.

The old institutions tend to endure well beyond their usefulness, because the control they exercise gives them access to financial resources, whereby they can hire talented people to perpetuate themselves. Much of the activity of Canadians revolves about the production and consumption of products and services dominated by old world views.

In the recent period of financial constraint, the reflexive action has been to reduce those activities which do not generate a product or service that can be readily sold in the marketplace. This has had a negative effect on the development of the knowledge required for environmentally-sustainable behaviour. Stuart Hill has commented on the funding of research on ways to design and maintain agro-ecosystems:¹⁰

"Clearly, there is little support for such research because it involves virtually no 'sale of products' and hence no industrial interest. What you may not know is that it is becoming almost impossible in Canada, and in most of the industrial world, to receive significant research support from government without matching support from industry. This is a major barrier in our evolutionary transition to a post-industrial era."

Infrastructure exerts its own control. The urban sprawls, encouraged in many cities after the Second World War, were designed for the automobile. Living within them, makes the use of the automobile almost compulsory. Those people forced to use cars by physical circumstances, may deny the environmental consequences of their use or live with the ambiguity in an uneasy truce.

The design of many organizations has been shaped by the Newtonian, mechanical view of the universe. This perspective was strengthened during the machine age of the industrial revolution, when it became fashionable to refer to people metaphorically in terms of machines, for example, as cogs on a wheel. It was a short step from being a "cog", to a position in a large organization, to a place on the production line, or to being a consumer in the marketplace. The main problem with this arrangement is that most of the "positions" demand only a small part of the total person.

¹⁰Hill, Stuart. *"EAP News"*. Vol. 14, No. 1 (Winter 1994), at p. 2.

In the past decade, it has been fashionable to talk of the growth of **small business**, and of the jobs they create. However, the **large corporations** have a great influence on their customers as well as on their employees. While the modern corporation likes to project its image as the primary source of all blessings, the corporation transforms the entire society to fit its mode of functioning. Thomas Berry, the American philosopher, suggests: "We are no longer sustained in the ever-renewing cycle of nature; we live now within the cycle of industrial production and consumption....Yet industrial society is so erratic in its functioning that it is unable to provide jobs consistently for the marketplace."¹¹

Large companies are growing in influence, but their visions are "partial" in that their prime concern is the welfare of their businesses, and the welfare of the environment is seen through that filter. This partial vision can hinder the implementation of sound environmental practices. In 1991, the five hundred largest businesses of the world controlled 25 percent of the world's gross output while employing .05 of one percent of the population of the world. While the global economy has been growing at a annual rate of from 2 to 3 percent, the largest multinational companies as a group are growing at a rate of from 8 to 10 percent.¹² This does not deny that commercial interests have brought many benefits to society, it is simply that the benefits may be outweighed by the accumulation of environmental costs.

The awareness of some people of the damage inflicted on them by existing structures, makes it easier for them to relate to the damage caused to the environment by the "partial" theories of economics. Other developments contribute to this alliance for change. Ecology is providing the scientific base for reconnecting whole people with the whole earth. Carl Jung defined a psychological framework for a person to recognize himself or herself as a microcosm of the universe, interlinked with everything else. When information technology is added to this potent mix, the door opens even wider on new vistas.

Denial of Problems by Some People in Positions of Leadership

Many in positions in power have been sufficiently successful on their terms within existing structures, that they are unwilling to see them changed. The admission of flaws may reflect on the quality of their leadership, and this encourages the denial of problems, until they become unavoidable. This behaviour is prevalent throughout Canadian structures. Denial explains, in part, problems such as high deficits, and the collapse of fisheries.

¹¹Berry, Thomas. "The Dream of the Earth". San Francisco: Sierra Club Books, paperback edition, 1990, chapter 11.

¹²Hawken, Paul. "The Ecology of Commerce". New York: Harper Business, 1993, at p. 91-92.

Dogma and Self-Serving Propaganda

As with all periods of major transformation, many will resist change, falling back on dogma or self-serving propaganda. People in various sectors may feel emotionally tied to their companies or causes, and be unwilling to give up beliefs that have motivated them, even when confronted with conflicting evidence. At a more calculating level, some representatives of industry may be paid to deceive. For example, the tobacco industry has developed arguments beyond the fringe of common sense to justify smoking. On the other hand, some environmentalists may distort information for their ends.

Surely, this is a time which will require people to rise above their own special interests, and to listen deeply and carefully to other perspectives.

PART 4 - CONCLUSIONS

Charting a Course Through Barriers

The material gathered during the preparation of this paper, and the analysis, suggest the following strategy, which is set out for discussion and debate. It is acknowledged that the Government of Canada has undertaken some positive initiatives, which have begun to address some of the points mentioned below.

- **When dealing with these issues, think strategically, imaginatively, pragmatically, and flexibly to take advantage of opportunities:** Too often, environmental barriers are approached with a single issue focus, and are not viewed as other than moral issues. This can isolate environmental issues from everything else. For example, since Canadian farmers use far less pesticides on their crops than their major competitors (one-fourteenth the level of European farmers), they can market their products as low pesticide-input food. This may command premium prices, encouraging farmers to find new ways to reduce or eliminate the use of pesticides.
- **Recognize Ecosystem Science as the New Foundation for Public Policy:** Increasingly, future decisions on human needs will be determined not primarily by economic theory, nor by industry or human wants alone, but by the capacity of ecosystems to meet those needs on a sustainable basis.
- **Build the Information Base:** A more comprehensive information base is required to link human activities with the environment and ecosystems. Almost all the people interviewed emphasized the need to increase research and development in this area. Unfortunately, some funds for research and development are being reduced along with other governmental expenditures, at a time when a better information base is required for sound environmental practices.

- **Set Clear Objectives with a Longer-term Perspective, and Set Priorities:** Both governments and companies are demoralized and frustrated by a lack of direction or sudden shifts with every gust of wind. Businesses need advance notice of proposed environmental changes, so that they can build new standards into their operations at the opportune time of their investment cycle.
- **Do Not Wait for Perfect Information before Acting:** Information is always expanding, and its perfectibility is a mirage. Many actions are required now on a "best judgement" basis.
- **Recast Policies to Build on the Ecological information Base:** A logical starting point would be ecological tax reform, building on the policy proposal of Ernst Von Weizsacker and Jochen Jesinghaus.¹³ Their proposal was created with the intention of changing the fiscal framework without imperiling prosperity. They added that it has become a necessity to develop new policy proposals to create a dynamic movement in the wealthy countries to save natural resources used as inputs, reduce greenhouse gas emissions and waste products, and at the same time, keep the countries in a healthy state. In Canada, caught in an era of budgetary constraint, Government may not have the time or the staff to undertake such as review; in which case, it could be assigned to an external organization, such as a tax foundation working closely with leading tax accountants and holistic scientists.
- **Refocus Organizations:** The information base will provide policy makers with guidelines based on good science and attention to detail. A much greater degree of integration of existing organizations is required. More public workers will need to be reassigned to field work. This move would not be dissimilar to actions taken by many large companies to place more people in the front lines to be closer to customers, and, would have been a real benefit had fishermen and government scientists been talking to one another prior to the collapse of the groundfishery on the East Coast.

Most people in departments dealing with renewable resources recognize that these resources must be harvested on a sustainable basis. They are in the process of developing appropriate strategies. For them to succeed, it is critical for central agencies to reflect the same concerns.

Consider creating an environmentally sustainable business corporations act, setting out some standards and an organizational structure more in keeping with ecological insights. The work of the International Standards Organization on "The Guide to Environmental Management Principles, Systems and Supporting Techniques" (ISO 14000) would provide some useful guidelines.

¹³Von Weizsacker, Ernst U.; and Jochen Jesinghaus. *"Ecological Tax Reform"*. London: Zed Books, 1992

Create some environmentally-sustainable communities. The model forest program has been very successful. It may be possible to develop some communities based on the principles of environmentally-sustainable development. The initiative and sustained leadership would come from the community level in alliance with environmental industries, which would work with the sustainable communities to test and market their products and services. Potential customers for Canadian green industries could see them in action in sustainable communities. If these projects succeeded, it would help to place participating communities in the forefront of an environmentally-sustainable economy.

- **Bold Inspirational Leadership and Political Will Are Required:** Some of the respondents referred to the need for "political will" to remove barriers to sound environmental practices. They mentioned barriers of inertia and complacency. Quite clearly, exceptional leadership is required to implement sound environmental practices. In a complex organization where work is deeply regularized, such as in government, it is especially important to have leadership that insists on constant open self-examination of everything, on receptiveness to change, and on the budgetary encouragement of innovation.¹⁴ This will be essential if organizations are to manage environmental issues that cut cross boundaries of jurisdictions and departments. Otherwise, there is a danger that after all is said and done, mostly all that's done is said.

A PARTING NOTE

This paper has explored some barriers to the application of sound environmental practices, which form a preliminary step to a more profound understanding of humanity interconnected with the living earth. Ecology has been the messenger of change. As a holistic science, it is in danger of being "shot" by the specialists. Managers may take some of its insights and reject others, without realizing that it is the wholeness of the perspective of this body of knowledge that makes it unique, integrative and very promising.

¹⁴Levitt, Theodore. *"Thinking About Management"*. Toronto: The Free Press, 1991, at p. 66

ANNEX "A"

A SAMPLING OF THINKERS - ON BARRIERS TO SOUND ENVIRONMENTAL PRACTICES

The purpose of this section is to go back to some of the writings of thoughtful people, who have alerted many others to the dangers of unsound environmental practices, but, even more importantly, they have sought the root causes of the current predicament. This section of the paper gives some additional depth of perspective to this exploration of barriers, on the assumption that a more extensive understanding of causes, will ultimately produce better solutions.

Wise people have been giving advice that has been noted, but perhaps not deeply heard. The question still stands regarding why it should take so long to heed the warnings. There is much logic in them. Perhaps people infatuated with greed, avarice, and self-interest, have lost the taste for the public good. They may need to be wakened from their slumber, or they may choose to sleepwalk, but through restructured institutions that will guide them down more environmentally-sound paths.

The barrier of the conditioned human mind is the most complicated and subtle obstacle to achieving more sound environmental practices. This suggests a change in the focus of education. Paul Erhlich and Robert Ornstein¹ state that evolution has created a human mind that responds well to short-term crises, but which often overlooks the longer-term dangers such as toxic pollution and global warming. Building on the evidence of the adaptability of the human brain, they suggest a completely different approach to education with a focus on understanding the nature of humanity itself, including the nervous system, physiology, evolutionary and recorded history, relationships with the environment, societies, moral judgements and possibilities. They emphasize the need for people to shift their understanding of themselves as separate individuals, each seeking his or her own welfare, to an understanding of how people fit into the social, biological, and physical environments. they consider that it is not that increasing scientific knowledge makes learning morals obsolete, but that the new world people have created makes the nature of moral choices unprecedented.

The question can be asked whether such a educational system can be developed in time. George Grant² made the following comment on the focus of education in Canada: "The chief job of the universities within the technological societies is the cultivation of those sciences, which issue in the mastery of human and non-human nature."

¹Ehrlich, Paul; and Robert Ornstein. "New World, New Mind". New York: Simon and Shuster Inc., 1989.

²Grant, George. "Technology and Empire". Toronto: House of Anansi, 1969.

George Grant wrote this thought in the 1960s when the public sector in Canada was not as severely indebted as now. In the current situation, the private sector has more flexibility in its spending than the public sector. Private companies have more power than ever to demand that young people are trained and research programs focused to meet their needs. At a time when good jobs are not as available as they once were, private companies can afford to hire very able spokespersons to defend their interests. This is not to ascribe to private companies any degree of malevolence. It is natural that they should defend their interests. However, their visions are often partial, at a time when holistic perspectives are required.

Now that **moral choices** are needed, most people follow the path described by Maynard Keynes, that first we should all become rich for that is the path to world peace. The environmental consequences of this direction are becoming clear, and people may not survive their lack of attention to ethical matters. Why were people much safer in large North American cities in the midst of the depression of the 1930s than they were in the 1980s? The statistics of prosperity set out by conventional economic reporting is a Potemkin village with grand avenues and buildings with false fronts concealing the shabby alleys where the future may be decided. A sound ethical foundation comes first. Without that, a society cannot develop the trust essential to the smooth functioning of any human enterprise.

Barry Commoner wrote about some barriers to sound environmental practices in 1971: ³

"There is a sharp contrast between the logic of ecology and the state of the real world in which environmental problems are imbedded. Despite the constant reference to palpable, everyday life experiences - foul air, polluted water and rubbish heaps - there is an air of unreality about the environmental crisis. The complex chemistry of smog and fertilizers and their even more elaborate connections to economic, social, and political problems are concepts that deal with real features of modern life, but they remain concepts. What is real in our lives, and, in contrast to the reasonable logic of ecology, chaotic and intractable, is the apparent hopeless inertia of the economic and political system; its fantastic agility in sliding away from the basic issues which logic reveals; the selfish maneuvering of those in power, and their willingness to use often unwittingly, and sometimes cynically, even environmental deterioration as a step toward more political power; the frustration of the individual citizen confronted by this power and evasion; the confusion that we all feel in seeking a way out of the environmental morass. To bring environmental logic into

³Commoner, Barry. *"The Closing Circle: Nature, Man and Technology"*. New York: Alfred A. Knopf Inc., 1971, chapter 13..

contact with the real world, we need to relate it to the over-all **social, political, and economic** forces that govern both our daily lives and the course of history."

"There are certain luxuries which the environmental crisis, and the approaching bankruptcy that it signifies, will, I believe, force us to give up. These are the political luxuries which have so long been enjoyed by those who can benefit from them: **the luxury of allowing the wealth of the nation to serve preferentially the interests of so few of its citizens; of failing fully to inform citizens of what they need to know in order to exercise their right of political governance; of condemning as anathema any suggestion which re-examines basic economic values; of burying the issues revealed by logic in a morass of self-serving propaganda.**"

E.F. Schumacher⁴ identified the following barriers:

- "Economically, our **wrong living** consists of systematically cultivating **greed and envy** and thus **building up a vast array of totally unwarrantable wants.**"
- "The neglect, indeed the rejection of **wisdom** has gone so far that most of our intellectuals have not even the faintest idea what the term could mean. As a result, they always try to **cure a disease by intensifying its causes.** The disease having been caused by allowing cleverness to displace wisdom, no amount of clever research is likely to produce a cure. But what is wisdom? Where can it be found? Here we come to the crux of the matter. It can be read about in numerous publications but it can be found only inside oneself. To be able to find it, one has first to liberate oneself from such masters as greed and envy.
- "Man's needs are infinite, and infinitude can be achieved only in the spiritual world, never in the material."
- "The **cultivation and expansion of needs is the antithesis of wisdom.** It is also the antithesis of freedom and peace. Every increase in needs tends to increase one's dependence on outside forces over which one cannot have control, and therefore increases existential fear."

⁴Schumacher, E.F.. "Small Is Beautiful". London: Penguin Group, Abacus Edition, 1974.

Schumacher takes Maynard Keynes to task for advocating greed and avarice as a path to prosperity for all, when, once again, people can begin to value means and ends, and prefer the good to the useful. Schumacher refers to a statement made by Keynes in 1930 during the depression:

"We must pretend to ourselves and to everyone that fair is foul and foul is fair; for foul is useful, fair is not. Avarice and usury and precaution must be our gods for a little longer still. For only they can lead us out of the tunnel of economic necessity into daylight."

Oddly enough, Keynes, the great economist, is talking the language of ethics, or rather non-ethics. He is saying that universal prosperity is possible on the basis of the materialist philosophy of "enrich yourselves", and that this is the road to peace. This is illusory. Wealthy and powerful countries have great wars. However, the advocacy of Keynes has taken root, as an observer of the greed of the 1980s will substantiate, while many social ills proliferate. This strange prosperity, this partial well-being may come at too high a cost. Perhaps Keynes, undoubtedly clever, was not wise. He may have contributed to the spiritual impoverishment ascribed by Schumacher to a "small, mean, calculating attitude to life, which refuses to see any value in anything that fails to promise an immediate utilitarian advantage."

Thomas Berry⁵, the American monk, probed deeply into the term "**patriarchy**", identified by the women's movement as "the deepest and most destructive level of determination in the Western perception of reality and value". This meaning of the word has not yet found its way into the dictionary. Berry says:

"We are confronted with a profound reversal of values. The entire course of Western civilization is seen as vitiated by **patriarchy, the aggressive, plundering, male domination of our society**. This condemnation is more severe in its implications than the secularist judgment of our religious culture as suppressive of basic human values. It is also greater than the Marxist condemnation of the bourgeois oppression of the Proletariat"

Berry argues that the four **major establishments of patriarchy are the classical empires, the ecclesiastical establishment, the nation state and the modern corporation**. He adds that however benign our view of these establishments or however brilliant in some of their achievements, they have become progressively virulent in their destructive powers, until presently, they are bringing about the closing down of all the basic life systems of the planet.

⁵ Berry, Thomas. "The Dream of the Earth". San Francisco: Sierra Club Books, paperback edition, 1990, chapter 11.

Berry suggests that while the modern corporation likes to project its image as the primary source of all blessings, the corporation transforms the entire society to fit its mode of functioning. "We are no longer sustained in the ever-renewing cycle of nature; we live now within the cycle of industrial production and consumption....Yet industrial society is so erratic in its functioning that it is unable to provide jobs consistently for the marketplace."

In "Beyond Interdependence"⁶, Jim MacNeill and his co-authors state:

- "The obstacles to sustainability are not mainly technical; they are **social, institutional and political**. Given the constraints on social, institutional and political change, no one can rule out a future of progressive ecological collapse."
- "Overcoming the obstacles to sustainable development will require **political vision and courage in policy and institutional change** on a scale not seen in this century since the aftermath of World War II."
- "The **present institutional and policy framework for environment and development is not capable of meeting this new political challenge** of meeting calls for action that cut across traditional boundaries between public agencies and between domestic and foreign policy. Environmental protection and resource management agencies, national and international, have tried to do the best job possible within the limits of their mandates and budgets, but they cannot address the sources of the problems. The **agencies are small; they lack political clout; and the budgets available to them are often derisory** in comparison with the tasks they have been assigned. More significantly, their mandates limit them to action on the symptoms of the problems - the negative effects of development - at the downstream end of the investment cycle."
- "The **central economic and trade agencies**, the development assistance agencies and banks, the energy, agriculture, and other key sectoral agencies that can influence the sources of the problems have been given no responsibility to do so."

Unlike the other books, "Beyond Interdependence", sets out an agenda for changing: the way governments intervene in the market to create incentives and disincentives for different types of economic activity; the design of the tax system; the counting of economic activity to measure the "health" of an economy; and, the

⁶ MacNeill, Jim. Pieter Winsemius. Taizo Yakushiji. "Beyond Interdependence: The Meshing of the World's Economy and the Earth's Ecology". New York, Oxford: Oxford University Press, 1991, at p. 19.

ways in which corporations and the central economic, finance, trade, and sectoral agencies of government, including local government are made responsible or held accountable for the environmental consequences of their policies, projects, budgets, and expenditures.

It is time to heed the advice of wise people and to hasten the transformation of human activities and institutions at the core.

